REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants have amended claim 1 to further define the at least one substituent of the compound having at least one substituent derived from an amine functional group, consistent with the description on page 18, the last paragraph on page 20, and pages 22, 24 and 25, of Applicants' Substitute Specification submitted with the Preliminary Amendment filed September 27, 2006 (hereinafter "Applicants' Substitute Specification").

In addition, Applicants are adding new claims 13-16 to the application. Claim 13, dependent on claim 1, recites that R_3 in the general formulae (7)-(9) has 1-20 carbon atoms. Note, for example, page 18 of Applicants' Substitute Specification. Claim 14, dependent on claim 1, recites that the compound of the component (B) serves as a chain extender capable of increasing molecular weight of the polymer of the component (A) during a heat treatment of the photosensitive resin composition; and claims 15 and 16, each dependent on claim 1, define amount of the compound of the component (B), relative to 100 parts by weight of the polymer of the component (A), in the photosensitive resin composition. Note, for example, the paragraph bridging pages 25 and 26 of Applicants' Substitute Specification.

Applicants respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the reference applied by the Examiner in rejecting claims in the Office Action mailed September 25, 2008, that is, the teachings of U.S. Patent No. 6,929,891 to Rushkin, et al., under the provisions of 35 USC 102 and 35 USC 103.

It is respectfully submitted that this reference as applied by the Examiner would have neither taught nor would have suggested such a photosensitive resin

composition, or method for forming a pattern using such composition, or an electronic part having an electronic device with a pattern obtained by such method, as in the present claims, including wherein such composition includes, in additional to, inter alia, a photoreactive compound and a polymer having an acid functional group and/or a substituent derived therefrom, a compound having at least one substituent derived from an amine functional group, such at least one substituent being selected from the group consisting of the general formulae (7)-(9). See claim 1.

In addition, it is respectfully submitted that the reference as applied by the Examiner would have neither taught nor would have suggested such photosensitive resin composition as in the present claims, having features as discussed previously in connection with claim 1, and, additionally, wherein the compound of the component (B) has one or two substituents derived from an amine functional group (see claim 3); and/or wherein R_3 in the general formulae (7)-(9) is a monovalent organic group having 1-20 carbon atoms (see claim 13); and/or wherein the compound of the component (B) serves as a chain extender capable of increasing molecular weight of the polymer of the component (A) during a heat treatment of the photosensitive resin composition (note claim 14); and/or amounts of the compound of the component (B), relative to amount of polymer of the component (A), in the photosensitive resin composition, as in claims 15 and 16; and/or substituents in components (A) and (B) as in claims 5 and 6.

Furthermore, it is respectfully submitted that the teachings of the applied reference would have neither disclosed nor would have suggested such photosensitive resin composition as in the present claims, having features as discussed previously in connection with claim 1, and, moreover, wherein the polymer

of the component (A) is a heat-resistant polymer (see claim 7), particularly a polyimide precursor, polyimide, polybenzoxazole precursor or polybenzoxazole, or copolymer or mixture thereof as in claims 9 and 12; and/or wherein the acid functional group in the polymer of the component (A) is a carboxyl group and/or a phenolic hydroxyl group (see claim 8).

The present invention relates to a photosensitive resin composition, method of use thereof and products formed therewith, such photosensitive resin composition being useful, for example (and not to be limiting), as a heat-resistant photosensitive material in a surface protecting film or interlayer dielectric film for a semiconductor device.

In the semiconductor industry, in recent years, organic materials having heat resistance, such as polyimide resins, have been used in, e.g., interlayer dielectric films. As described in the last full paragraph on page 2 of Applicants' Substitute Specification, improvement of development properties of photosensitive resins is important, and therefore the resin is comprised of a polymer having a low molecular weight for increasing solubility. However, polymers having a low molecular weight exhibit unsatisfactory mechanical properties after curing, and thus conventional photosensitive resin materials have a problem in that they cannot exhibit advantageous resin properties.

Against this background, and as a result of intensive studies by the present inventors, it has been found that by using a heat-resistant polymer or a precursor thereof having an acid functional group or a substituent derived therefrom, together with a compound having specific functional groups, the resin component can be cured to have an increase in molecular weight, so that a cured resin having desired

properties can be formed, without sacrificing development properties. Note the first full paragraph on page 3 of Applicants' Substitute Specification.

Specifically, through use of the compound of the component (B) as in the present claims, together with the recited polymer, a photosensitive resin composition is achieved which has good development properties, yet which exhibits good properties as a layer after curing.

Rushkin, et al. discloses a negative photosensitive resin composition which is a chemically amplified, aqueous-based developable photosensitive polybenzoxazole precursor composition, suitable for application in the field of microelectronics. The photosensitive composition described in this patent includes one or more polybenzoxazole precursor polymers; one or more photo-active compounds which release acid upon irradiation; a latent crosslinker which contains at least two N-$(CH_2OR)_n$ units, wherein n is 1 or 2 and R is a linear branched C_1-C_8 alkyl group (with proviso); and at least one solvent that is not N-methyl-2-pyrrolidone. See column 2, lines 18-54. Note also column 2, line 55, to column 3, line 26, for a method of using this composition.

Note that Rushkin, et al. discloses a latent crosslinker which contains at least two N-$(CH_2OR)_n$ units. It is respectfully submitted that the teachings of this patent do not disclose, nor would have suggested, such composition as in the present claims, including wherein the compound having at least one substituent derived from an amine functional group includes such at least one substituent selected from the group consisting of the general formulae (7)-(9) as in the present claims. Specifically, it is respectfully submitted that the latent crosslinker containing the at least two units as in Rushkin, et al., does not disclose, nor would have suggested,

the compound having the least one substituent as in the present claims, and advantages achieved thereby.

In this regard, it is emphasized that in Rushkin, et al., the crosslinker generates crosslinks during exposure. Note, in particular, the description in columns 13 and 14 in Rushkin, et al., disclosing that the latent crosslinker, when interacting with an acid formed after irradiation of the photo-active compound, forms a "carbocation", as described in the text material bridging columns 13 and 14 of Rushkin, et al. The "carbocation" formed from the crosslinker can then react with an OH group in a polymer chain or undergo a Friedel Crafts reaction with an aromatic ring, with reaction of two or more sites of the crosslinker with two or more polymer chains resulting in crosslinks, the crosslinks rendering the polymer less soluble in developer and creating a solubility differential with the unexposed areas necessary for image formation.

In contrast, the compound of the component (B) according to the present invention serves, for example, as a chain extender capable of increasing the molecular weight of the polymer of the component (A) during heat curing, the polymer of the component (A) being increased in molecular weight so that a cured resin having desired properties can be formed.

As can be seen from the foregoing, as well as from a full review of the teachings of Rushkin, et al. as compared to the present invention, it is respectfully submitted that Rushkin, et al. would have neither taught nor would have suggested the presently claimed subject matter, including the at least one substituent of the compound of the component (B), or functioning of the present invention.

The contention by the Examiner in the paragraph bridging pages 2 and 3 of the Office Action mailed September 25, 2008, is noted. However, it is again

emphasized that Rushkin, et al. discloses a crosslinker having at least two N-$(CH_2OR)_n$ units; and it is respectfully submitted that these at least two units described in Rushkin, et al. would have neither taught nor would have suggested the substituents represented by the general formulae (7)-(9), as in the present invention, or functioning thereof as part of the presently claimed composition.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims presently pending in the above-identified application are respectfully requested.

Applicants request any shortage of fees due in connection with the filing of this paper be charged to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (case 1270.46593X00), and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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